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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/749,926	12/29/2000	Kazuhiro Takahashi	35.G2735	6871

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EXAMINER

NGUYEN, HUNG

ART UNIT PAPER NUMBER

2851

DATE MAILED: 03/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/749,926

Applicant(s)

TAKAHASHI ET AL.

Examiner

Hung Henry V Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on RCE filed 2/24/03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 24, 2002 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Takahashi et al (U.S.Pat. 5,892,573).

With respect to claims 1, 8 and 12, Takahashi et al (fig.1) discloses an exposure apparatus and method comprising all basic features of the instant claims such as: a light source (1) comprises a pulse light; an illumination optical system (2, 3, 20-21, 5-8) for illuminating a predetermined pattern formed on reticle (R); a projection optical system (10) for projecting the pattern formed on the reticle onto a substrate (W); a first photodetector (12) disposed in a portion for receiving light from an optical path between the light source and a portion where the reticle is positioned for monitoring an emission light amount from the light source and light processing systems (102-103) for processing the detected signal from the first light quantity detector (12)

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and correcting the coefficient/output energy (see col.5, lines 65-67 and col.6, lines 1-5; col.7, lines 1-4).

With regard to claims 2-5, 7, 9-11, Takahashi et al further teaches the processing system further performs sensitivity correction of the first photo detector relative to an illuminance on a plane corresponding to a surface of the substrate in accordance with the estimated change of transmissance (see col.6, lines 20-34); a reticle stage (9) for holding and driving the reticle in a direction perpendicular with the optical axis of the illumination optical system ; a second photo detector (13) having a light receiving surface placed at the height of the substrate for detecting the exposure light passing thru a light transmittance portion the reticle stage; an ND filter (20) and a masking plate (6)

With regard to claims 6 and 14-16, Takahashi teaches and the processing system (102-103) determines the changes in the transmissance of the illuminating system and the projection optical system based on the detection signals from the photodetectors 12 and 13. In the Remark filed 2/24/2003, applicants argued that Takahashi et al'573 fails to disclose or suggest "a processing system estimating a change in transmittance of at least an optical element disposed between a light source and a portion where a photosensitive object is placed, on the basis of information of the pulse energy of the light source, an oscillation frequency of the light source and elapse information of the exposure". The Examiner respectfully disagrees with applicant since Takahashi's 573 meets all of the limitations as broadly claimed. As clearly illustrated from figure 1 of Takahashi, photodetector (12) is placed between the light source (1) and mirror (8) for receiving the light from an optical path between the light source and a portion where the reticle/original (R) is placed, the photodetector (12) monitors an emission of light from the light

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source (see col.4, lines 43-48). Thus it is understood that the optical elements preceding photodetector 12 are optical elements through which exposure light passes. If changes in transmittance of optical elements preceding photodetector 12 occurs, the exposure amount reaching photodetector 12 changes and a change in the transmissivity of the illumination optical system (100) is “a change of transmittance of at least an optical element between the light source and the first detector” and is monitored by photodetector (12) regardless of whether or not the reticle/original is disposed in the path of exposure light or not. Furthermore, Takahashi et al’ 573 clearly states that “*the transmissivity of optical components varies due to irradiation with exposure light from the light source*, it results in a difference between the actual light quantity on wafer W and the light quantity as predicted *from the output signal S1 of the first detector 12* (see col.9, lines 48-50). The applicant is also directed to column 10, lines 1-7 of Takahashi et al’ 573. Therein it is clearly disclosed that the output signal S1 from the photodetector 12 suggest changes in transmittance of the illumination optical system (100) which is a change of transmittance of at least an optical element between the light source and said light photodetector. Takahashi et al’s 573 teaches correcting light quantity error due to variation with time of the optical components, output signals from the first photodetector 12 applied **to the light quantity calculating means 102 and control system 103 to calculate a correction coefficient and adjust the voltage applied to the light source (see col.5, lines 62-67 and col.13, lines 46-51)** . Finally, Takahashi et al notes that “Optimum transmissivity of the ND filter (20)/ (or “at least optical element” as claimed) can be calculated by the light quantity calculating means 102” (see col.7, lines 40-42); and the output voltage applied to the pulsed laser as well as the pulse

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emission frequency of the light source is set by control system 103 (see col.6, lines 65-67 and col.8, lines 20-26).

Response to Applicant's Amendment and Remarks

4. With respect to claims 1-13, and newly added claims 14-16, applicant's arguments with respect to the applied reference have been carefully reviewed but have been traversed. The limitations of these claims are still read on the reference of Takahashi et al 's 573 under 35 U.S.C. 102(b) rejection as set forth above.

Prior Art Made of Record

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


Ozawa (U.S.Pat. 6,501,535) teaches exposure apparatus which comprises substantially all elements as recited in the claims of the instant application.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Henry V Nguyen whose telephone number is 703-305-6462. The examiner can normally be reached on Monday-Friday (First Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams can be reached on 703-308-2847

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4900.

Hvn
March 6, 2003


Hung Henry V Nguyen
Primary Examiner
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